

REMARKS

Claims 25, 39, 41 and 42 have been amended to recite and the gas inlets of the angled gas passages are located equal distances from the central axis of the bore. Support for these amendments can be found at paragraph [0033] and FIG. 3A of the specification (U.S. Patent Appl. Pub. No. 2001/0010257). Claims 25, 28-36 and 38-45 are pending. Reconsideration and allowance are respectfully requested in view of the following remarks.

Claim Rejections - 35 U.S.C. § 103

Claims 25, 28-36 and 38-45 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Koshimizu (U.S. Patent No. 5,935,373) ("Koshimizu") in view of Deacon (U.S. Patent No. 5,792,269) ("Deacon") and Dornfest (U.S. Patent No. 5,680,013) ("Dornfest"). Applicants respectfully traverse this rejection.

Independent Claim 25 recites, *inter alia*, a gas injector for supplying process gas to a plasma processing chamber wherein a semiconductor substrate is subjected to plasma processing, the gas injector comprising, a bore and gas passages in fluid communication with the bore, the bore defined by a cylindrical sidewall and an endwall, the gas passages including gas inlets located in the endwall and gas outlets located in the planar distal end surface of the gas injector body; wherein the gas inlets are closer to a central axis of the bore than the gas outlets and the gas inlets of the angled gas passages are located equal distances from the central axis of the bore (emphasis added). Claims 39, 41 and 45 recite similar features of the gas passages.

A. The Examiner's Position

The Official Action cites Koshimizu for disclosure of gas processing supply port **156** (Official Action at page 3). The Official Action acknowledges that Koshimizu does not disclose all the features of independent Claims 25, 39, 41 and 42, but cites Deacon for disclosure of plural angled passages 42, Figures 5 and 6 (Official Action at page 9). Dornfest is cited merely for a teaching of ceramic protection for plasma electrodes (Official Action at page 9).

B. The Combination of Koshimizu and Deacon Does Not Disclose All Claim Features

Koshimizu discloses a gas processing supply port **156** for plasma etching apparatus **100** (column 5, lines 42-43; FIG. 1), but provides no disclosure of gas passages in an endwall in gas processing supply port **156** (FIG. 1). The Official Action cites Deacon for angled gas passages but neither Deacon nor Koshimizu provides any suggestion of a gas injector body wherein "the gas inlets are closer to a central axis of the bore than the gas outlets and the gas inlets of the angled gas passages are located equal distances from the central axis of the bore," as recited in Claims 25, 39, 41 and 42.

Dornfest is cited only for features of ceramic protection and thus fails to cure the deficiencies of Koshimizu and Deacon.

As shown in Figure 2 of Deacon, faceplate 30 is nearly the same size as the wafer to be processed and the array of holes in the faceplate is intended to produce a uniform flow of deposition byproducts to achieve uniform deposition (column 1, lines 27-47). For a given volume of gas, it should be evident that the flow rate through a faceplate with 1400 holes will be much lower than the same volume of gas

passing through an injector with angled gas passages located equal distances from the central axis of a bore in a gas injector body.

Deacon provides various gas hole arrangements wherein gas inlets are located at various distances from a center of the faceplate. Clearly Deacon provides no suggestion of a gas injector body having "a center gas passage extending in the axial direction and a plurality of angled gas outlets extending at an acute angle to the axial direction," wherein the gas inlets of the angled gas passages are closer to a central axis of the bore than the gas outlets of the angled gas passages and the gas inlets of the angled gas passages are located equal distances from the central axis of the bore as recited in Claim 39.

Because a *prima facie* case of obviousness has not been established, Applicants respectfully request withdrawal of the rejection of Claims 25, 39, 41 and 42 under 35 U.S.C. §103(a). Dependent Claims 28-36, 38, 40 and 43-46 are also patentable over the applied combination of references at least for the same reasons as those discussed above regarding Claim 25, 39, 41 and 42.

Conclusion

For at least the foregoing reasons, Applicants respectfully submit that all pending claims are allowable, and this application is in condition for allowance. Accordingly, Applicants request a favorable examination and consideration of the

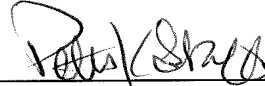
instant application. Should the Examiner to discuss this application, Applicants request that the undersigned be contacted at the number below.

Respectfully submitted,

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